UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY
Air Pollution Prevention and Control Division
Research Triangle Park, NC 27711

September 7, 2016

MEMORANDUM

SUBJECT: Review of QAPP for "Characterization of Air Emissions from Open Burning at Radford Army Ammunition Plant", Gullett, received July 20, 2016, QLOG No. A-21434-QP10, QTRAK No. 15030, QA Category III.

FROM: Robert S. Wright, Technical Services Branch

TO: Brian K. Gullett, Immediate Office of the Director

The quality assurance project plan (QAPP) is acceptable with minor revisions as is discussed below. Please note the QA review form to which these comments are attached. This QAPP needs minor corrections, but does not require an additional QA review. The recommendation "acceptable with minor revisions" allows data collection to start in parallel with the revision of the QAPP. Please respond to each QA review comment and send the responses and the revised QAPP to Billy Oshodi so that the APPCD QA files will have the final version of the document. The responses can be typed or hand-written as you prefer, although receiving them in Word format would be helpful.

I will be happy to meet with you to clarify these comments, if you wish. It is likely that the revision process will be easier if we discuss the comments so that you have a clear understanding of my meaning and that any misunderstandings that I have can be corrected. I encourage you to contact me to set up a meeting with me if you feel that it would be a fruitful use of our time.

QUALITY ASSURANCE REVIEW COMMENTS

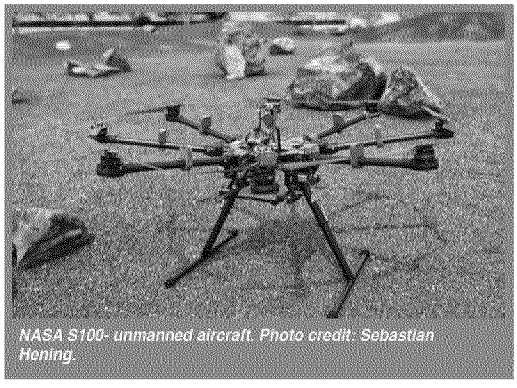
Line	Comment
General	NRMRL's QAPP requirements for measurement projects requires the following information about quality metrics (i.e., QA/quality control (QC) checks: 6.1. For each process measurement and analytical method, identify the required QC checks (e.g., blanks, control samples, duplicates, matrix spikes, surrogates), the frequencies for performing these checks, associated acceptance criteria, and corrective actions to be performed if acceptance criteria are not met. 6.2. Any additional project-specific QA objectives (e.g., completeness, mass balance) shall be presented, including acceptance criteria.

Line	Comments
	Because it information about QC checks is scattered throughout this document rather than being presented in a stand-alone section, several descriptions of measurements lack any information about the QC checks that will be performed, the acceptance criteria for these checks, and the corrective actions that will be performed in the event that the criteria are not attained. This requirement applies not only to samples that are analyzed at EPA, but also to samples that are sent to external laboratories for analysis. This document needs to specify how the external laboratories will report QC check results to EPA, what QC check results will be reported to EPA, and who within EPA will review these results to determine attainment of the acceptance criteria. Given that EPA does not have any control over the performance of external laboratories, it is important that EPA obtain evidence from the external laboratories that analyses were done correctly. **Response: _The format is better for us in the field; we prefer it that way for ease of referral – this comment is no longer necessary. If specific information is lacking, we'll address it.**_____
Cover	A new NRMRL QAPP cover page has been developed (see attached). Add the following information to the cover to conform to these requirements: - the name and organization of whoever prepared this document; - for extramural research, the contract number, work assignment or task number; - ORD national program, project number, and task number; and - NRMRL QA tracking number (G-APPCD-0021434). **Response:** **__attached.**_____
1	Add the NRMRL QA tracking number (G-APPCD-0021434). **Response:** **___done**_____
90	Remove the mention of "proposal" because this document is not a proposal.

Line	Comments
	Response: **__removed.**_____
111	Provide Dr. Gullett's first name. **Response:** **___Okay.**_____
115	Provide Dr. Aurell's first name. **Response: __ Okay**
117	Provide Dr. Chirayath's first name. **Response: __ Okay _**
122	Discuss any analytical duties and responsibilities that Dennis Tabor may have. **Response: __As stated: Mr. Dennis Tabor (EPA) will coordinate methods of sample transferral to an outside testing laboratory (likely Katahdin Analytical Services) for energetics analysis, Chester LabNet for gravimetrics and XRF for elements, ensuring that the team follows the appropriate protocol for sample containment, storage, and shipment. Tabor (EPA) will provide PCDD/PCDF mass to Dr. Aurell.**_____
124	Specify the duties and responsibilities of all external laboratories, including ALS, and what analyses each internal and external laboratory will perform

Line	Comments
	Response: __Section 4.6.3 states ALS' samples for Cl species on filters.
131	Discuss the duties and responsibilities of any additional on-site personnel. **Response: __Additional personal are not related to sampling and analysis.**
132	Libby Nessley is APPCD's quality assurance manager. Discuss her duties and responsibilities in Section 2.1. **Response:** **___added**
133	Replace Paul Groff with Libby Nessley in Figure 2-1 and Table 2-1. **Response:** **__done.**
133	Identify any additional on-site personnel by name in Figure 2-1. **Response:** **___Noted.**
142	Identify any additional on-site personnel by name. **Response: ___Noted again.**

Line	Comments
206	Table 3-1 presents the Mark 90 and skid waste tests to be conducted. The column for the target number of samples for each source is a bit unclear. What is a source? Are these the minimum number of samples that will be collected for both Mark 90 tests and for skid waste tests? Please clarify. **Response: __Now Table 3-2. "Source" is clarified.**_____
224	List the specific volatile organic compounds (VOCs) that will be analyzed. **Response: ___VOCs are in Table 3-4.**_____
233	Describe the unmanned aerial vehicle (UAV). Whose product is it? What is its expected payload and expected maximum flight time? How is it powered? **Response: ____I don't have these details.**_____
254-263	There is an apparent conflict between Table 3-1 and the text regarding the number of samples that will be collected. Please clarify. **Response: ____I think this has been reconciled.**_____
268	Reference the EPA publication on the evaluation of the Kolibri sampling system. **Response: ___done**_____

Line	Comments
285	Approximately how long does the 'eight pan burn' last? **Response: __Uneertain; they can space this out if they want.**_____
293	Replace the photograph of the University of Alaska- Fairbanks hexacopter with a photograph of the NASA octocopter (perhaps the photograph below).  NASA S100- unmanned aircraft. Photo credit: Sebastian Honing. **Response: _____This may not be the model they use; it depends on the Flight Safety Review Board findings.**_____
322	Provide a reference that describes, not just a mention of using, the carbon balance method. The original reference for the method appears to be Nelson Jr., R. M., *An evaluation of the carbon balance technique for estimating emission factors and fuel consumption*, Research Paper SE-231, United States Department of Agriculture, Forest Service, Southeastern Forest Experiment Station, Asheville, NC, USA, 1982. **Response: ____This is a commonly known and used method.**_____
339	References 2 and 3 are identical. Eliminate one of these references. **Response:** _____

Line	Comments
334	What is the source carbon dioxide (CO_2) calibration gas? What is its certified concentration and how is this concentration traceable to the National Institute of Standards and Technology (NIST)? **Response: _** AirGas. 4543 ppm. **All gas cylinders used for calibration are certified traceable to NIST standards.**
340	Describe any CO_2 background measurements. How frequently will they be made? **Response: ____Daily prior to any measurements and between burns.**
357	What is the source carbon monoxide (CO) calibration gas? What is its concentration and how is this concentration traceable to the National Institute of Standards and Technology (NIST)? **Response: _____Air Gas. All gas cylinders used for calibration are certified by the suppliers that they are traceable to NIST standards.**
365	Describe any CO background measurements. How frequently will they be made? **Response: ____Daily prior to any measurements and between burns.**

Line	Comments
371	What laboratory will perform the VOC analyses? Who will do the analyses? If this analysis is to be performed by an external laboratory, will someone at EPA review the QA check results? **Response: ____ALS. Tabor will review. Now added.**
379	Describe how the calibration curve will be generated using various amounts of 100 ppb TO-14 gas mixture. Will a gas dilution system be used? Will the calibration gas be directly injected into the GC/MS or will it be loaded onto the Tenax sorbent tubes and subsequently desorbed onto the GC/MS? **Response: __TO-14 was replaced with TO-17.**
379	Describe the composition and the source of the TO-14 calibration gas and the NIST traceability of its certified concentrations. Will QC checks be performed? If so, what are the acceptance criteria and corrective actions? **Response: ___ TO-14 was replaced with TO-17.**
386	What is the CO_2 concentration trigger point? **Response: __This will be determined in the field by Gullett and is a function of the observed levels.**
395	What is the source of the glass fiber thimbles for the semivolatile sampling?

Line	Comments
	Response: ___Fisher Scientific._____
418	Table 4-4 is inconsistent with Section 2.1 regarding which laboratory that will analyze semi-volatile organic compounds (SVOCs). If this analysis is to be performed by an external laboratory, will someone at EPA review the QA check results? **Response: __Likely APPI. We are trying to maximize the analyte list for the Army will minimizing the detection limit.___Tabor will review.**_____
423	Specify the model number for the SKC personal modular impactors (PMIs). **Response: __761-203B**_____
426	The section on $PM_{2.5}$ states that PM will be measured gravimetrically following the procedures described in 40 CFR Part 50 (40 CFR, 1987, App J). However, Appendix J gives the reference method for the determination of particulate matter as PM_{10} in the atmosphere. Please confirm that this method will be used for the analysis of the $PM_{2.5}$ samples. **Response: ____That is correct except.**_____
434	Provide information about the analytical balance and its vendor, if known. Provide information about the calibration of the analytical balance and traceability of its mass reference standards, if known. **Response: _balance Vendor unknown. "The balances are under computer control, and all weighing operations follow a strict QC program. All filters**

Line	Comments
	are weighed and data is recorded using a proprietary custom software program. This software automatically records analytical results. The software uses the information in the data file to calculate the net mass, as well as the difference in QA reweights. Tare and gross weights are electronically transferred to the laboratory information management system (LIMS)."
443	Table 4-6 is inconsistent with Section 2.1 regarding which laboratory that will analyze fine particulate matter ($PM_{2.5}$). If this analysis is to be performed by an external laboratory, will someone at EPA review the QA check results? **Response: _Fixed. Tabor reviews all external**
449	Describe the analytical instrumentation that will be used for the x-ray fluorescence (XRF) analysis of metals. How will this instrumentation be calibrated? If an external laboratory will perform the XRF analysis, will the external laboratory report QC check results to EPA? Who at EPA will review these results? **Response: ___External: Chester LabNet. Addressed.**
450	What is the source of the Teflon $PM_{2.5}$ filters? **Response: ____Chester LabNet**
455-461	A number of different analytical methods are mentioned in connection with the chrome VI and total chromium analyses and it is unclear which specific method will be used. Specify this method. If it is not a standard method, where is it

Line	Comments
	described? If it is not a standard method, how has the method been demonstrated to yield results that are comparable with standard methods? **Response: We have clarified this.**
455	Describe the analytical instrumentation that will be used for the chrome VI and total chromium analyses. How will this instrumentation be calibrated? If an external laboratory will perform the analyses, will the external laboratory report QC check results to EPA? Who at EPA will review these results? **Response: Clarified.**
456	List the source of the bicarbonate-impregnated, acid-hardened cellulose filters. **Response: done.**
478	List the part number of the coated filter cartridge for sampling hydrogen chloride (HCl), perchlorate, and chloride. **Response: Noted.**
491	Describe the analytical instrumentation that will be used for the HCl, perchlorate, and chloride analyses. How will this instrumentation be calibrated? Will the external laboratory report QC check results to EPA? Who at EPA will review these results? **Response:** Section modified.

Line	Comments
493	The text states that this filter will be analyzed for HCl by ion chromatography methods specified in EPA Method 26. However, Section 9 (Quality Control) of Method 26 is reserved and does not present any quality control procedures. What are the QC check procedures, acceptance criteria, and corrective actions for the HCl analyses? **Response: ___Section modified.**
559	Reference 25 does not describe the carbon mass-balance method and states: "Emission factors, EF(X) (grams of species X emitted per kilogram dry fuel burned) were calculated by the carbon mass-balance method (Burling et al., 2010; Nelson Jr., 1982; Yokelson et al., 1999)." It would be better to use Nelson, 1982 as the reference for the method. **Response: ___This is a common method.**